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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,555	01/04/2002	Panu Hagstrom	2709/0K126	8769

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EXAMINER	
NGUYEN, KHAI MINH	
ART UNIT	**PAPER NUMBER**
2687	

DATE MAILED: 01/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,555	HAGSTROM, PANU	
	Examiner	Art Unit	
	Khai M Nguyen	2687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/4/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is response to Amendment filed on 08/23/2004.

Claims 1-7 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins, Jr. (U.S. Pat-5355524) in view of Iwai Toru (Japan-63-222504).

Regarding claims 1 and 6, Higgins teaches a communications apparatus and a structure of a radio frequency front end comprising as functional units an antenna and at least one bandpass filter and at least one amplifier (fig.1, element 102, 106, col.1, lines 12-31), in which front end active and passive component parts have been integrated (col.1, lines 32-43, col.1, line 66 to col.2, line 23), the structure further comprising:

an antenna circuit board (fig.3, abstract, element 304, col.5, lines 12-54) on a first surface of which there is at least one radiating element and on a second surface of

which there is a conductive plane (*Both stripline substrates 304 and 306 have ground planes 302 in their outer or first surfaces 314 and 316, as well as a conductive resonator means such as conductive runners 308 in their inner or second surfaces 318 and 320 which form transmission lines. In the preferred embodiment the conductive runners 308 are grooves in the ceramic block which have their walls 324 metallized. The only portion of the inner surfaces 318 and 320 which are metallized are the groove walls 324 which form the conductive runners 308. The conductive resonator means 308 cooperates with ground planes 302 to form a stripline filter such as filter 206. Conductive resonator means 308 has a first terminal 322 which is coupled to the radio antenna (not shown) and a second terminal 324 which attaches to the antenna port of antenna switch 208 which is part of integrated section (IC) 202*, element 308 conductive runners);

a second circuit board (fig.3, element 306, col.5, lines 12-54) by which said at least one filter and at least one amplifier are supported on a first surface (element 206, 210, 212, col.5, lines 12-54) , and a second surface of which is conductive (element 308 conductive runners); and

a protective frame (fig.3, element 302) such that the antenna circuit board second surface, the second circuit board first surface and the protective frame form a substantially closed space (fig.3, element 302, the mobile phone inherently has a protective frame or housing);

wherein the antenna circuit board, the second circuit board with attached units and the protective frame form a single solid component (fig.3, element 202, col.5, lines 12-29),

Higgins fails to specifically disclose the distance between the second circuit board and the antenna circuit board in said component is substantially smaller than a quarter of a wavelength corresponding to any operation frequency of said front end. However, Iwai Toru teaches the distance between the second circuit board and the antenna circuit board in said component is substantially smaller than a quarter of a wavelength corresponding to any operation frequency of said front end (element d1 and d2, see abstract and constitution). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the distance between the second circuit board and the antenna circuit board in said component is substantially smaller than a quarter of a wavelength corresponding to any operation frequency of said front end as taught by Iwai with Higgins teaching in order to provide mobile phone that is small and meets consumer expectations relating to ease of portability.

Regarding claim 2, Higgins and Iwai Toru further teaches the structure of claim 1, comprising both a transmit and a receive branch, said functional units being a duplex filter, a low-noise amplifier and a receive filter, a transmit filter and a power amplifier, and a directional coupler (fig.1-2, col.2, line 34 to col.3, line17).

Regarding claim 3, Higgins and Iwai Toru further teaches the structure of claim 1, comprising both a transmit and a receive branch, said functional units being an antenna filter and antenna switch, a low-noise amplifier and a receive filter, a transmit filter and a power amplifier, and a directional coupler (fig.1-2, col.2, line 34 to col.3, line17).

Regarding claim 4, Higgins and Iwai Toru further teaches the structure of claim 2, said functional units further being at least a transmit branch mixer, a receive branch mixer, a modulator, a demodulator and filters associated with these (fig.1-2, col.2, lines 36-60, col.4, lines 17-24).

Regarding claim 7, Higgins and Iwai Toru further teaches the structure of claim 3, said functional units further being at least a transmit branch mixer, a receive branch mixer, a modulator, a demodulator and filters associated with these (fig.1-2, col.4, lines 17-47).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins, Jr. (U.S. Pat-5355524) in view of Iwai Toru (Japan-63-222504) and further in view of Huber et al. (U.S. Pat-4521913).

Regarding claim 5, Higgins and Iwai Toru further teaches the structure of claim 1, Higgins and Iwai Toru fails to specifically disclose an antenna being a multi-frequency antenna having at least two radiating elements on the antenna circuit board. However,

Huber teaches an antenna being a multi-frequency antenna having at least two radiating elements on the antenna circuit board (fig.1, col.1, line 51 to col.2, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an antenna being a multi-frequency antenna having at least two radiating elements on the antenna circuit board as taught by Huber with Higgins and Iwai Toru teaching in order to provide different transmitter frequencies according to a predetermined frequency scheme.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khai M Nguyen whose telephone number is 703.305.9006. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 703.306.3016. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Khai Nguyen
Au: 2687

12/17/2004

12/28/04
LESTER G. KINCAID
PRIMARY EXAMINER